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CASE REPORT

Emergency endovascular treatment of complicated type B Acute dissection of the aorta



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KEYWORDS

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Abstract Although Type B dissection accounts for 25–40% of all aortic dissections, their treatment remains to date quite controversial. In acute complicated cases (visceral malperfusion, refractory pain, etc.), surgical treatment is generally recommended, but is still associated with a high rate of morbimortality.

Implantation of endoprosthesis has been proposed as an alternative therapy for patients with high surgical risk.

Reports support that endovascular stent-graft treatments of a complicated type B acute dissection produce a short and medium term satisfactory results.

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1. Introduction

Acute dissection of the ascending aorta is associated with 55% of mortality during the first 14 days and requires prompt surgical therapy, which lowers the mortality of 20%, as opposed to acute dissection of the descending thoracic aorta which goes with a lower initial mortality, but the mortality is higher if it is complicated.¹

Since the first report of stent grafts in acute dissection by Dake et al. in 1994, several cases and cohort studies have demonstrated the feasibility and effectiveness of endovascular repair for complicated type B acute dissection including patients with malperfusion of the viscera, kidneys, spinal cord and the lower limbs.²

A clinical case of emergency thoracic aorta endovascular stenting is reported on a patient who had left lower limb malperfusion due to false lumen compression.

2. Case report

A 72 year old man was referred to our hospital after examinations for severe acute chest, lumbar pain and concomitant left lower limb ischaemia diagnosed as a Stanford type B acute dissection. His records revealed hypertension and a long history of smoking. At admission blood pressure was 190/100 mmHg and pulse rate was 100 beats/min. Physical examination showed coldness, pain and absence of arterial pulses in left lower limb. Peripheral pulses were palpable in the upper extremities and right lower limb.

Computed tomographic angiography (CTA) demonstrated a type B aortic dissection with evidence of aortic lumens and dual intimal flap. The primary entry tear is located after ostia of the left subclavian artery (LSCA) (Fig. 1A and B), and

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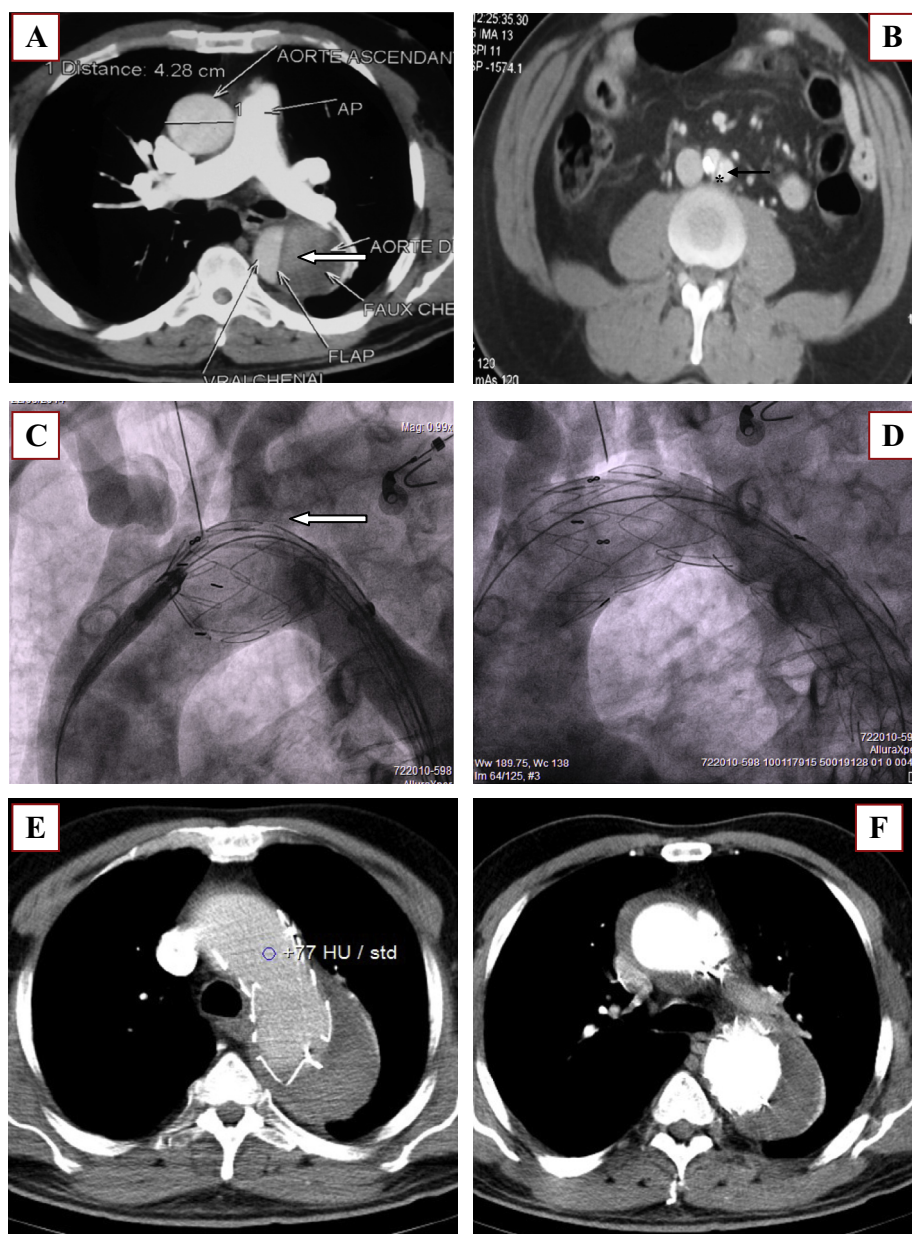


Figure 1 (A) Computed tomographic angiography (CTA) shows dissection descending thoracic aorta: arrow shows the false lumen. (B) CTA objecting aortic bifurcation. In left iliac artery false lumen (arrow) compressed completely true lumen (asterisk). (C) Peroperative angiography showing stent-graft placement. The entry tears in the descending aorta after ostia of left subclavian artery (arrow). (D) Angiography after stent deployment: no flow individualized in the false lumen. (E) Follow-up CTA 12 months: stent implantation at aortic arch. (F) CTA showing stent implantation at descending thoracic aorta; false lumen is completely thrombosed.

extends to the iliac bifurcation with no involvement of the ascending aorta or aortic arch artery. The left iliac artery was totally occluded by compression due to extending false lumen.

The maximum diameter of descending aorta was 56 mm and the false lumen diameter was 40 mm. An entry tear was found in the descending aorta 15 mm after LSCA. Initial descending aorta (landing zone) was also aneurysmal (40 mm of diameter).

A conventional repair was considered to be a very high risk and the option of stent-graft placement was discussed with the

patient who agreed to undergo this procedure. Treatment was performed 10 h after the onset of symptoms.

Under general anaesthesia, the right femoral artery was exposed and catheter angiography was inserted to localize the site of dissection and supraaortic branches. An initial angiogram verified the catheter position inside the aorta true lumen and confirmed the dissection and left lower limb malperfusion.

The stent-graft (VALIANT THORACIC/CAPTIVIA SYSTEM 44 mm × 212 mm) was advanced to the aortic isthmus and deployed under fluoroscopy control. (Fig. 1C and D).

Completion angiography confirmed total exclusion of the aortic tear and the false lumen with increased blood flow in left lower limb. In early postoperative course, the patient was transferred to an intensive care unit and close clinical monitoring focused on persistence of the left lower limb ischaemia.

A CT scan before discharge of the patient confirmed a patent stent without endoleak and most of the false lumen was thrombosed. The left iliac artery was permeable.

Patient was discharged on the 5th day after the procedure. No complications have been identified during regular follow-up (1, 3, 6 and 12 months) (Fig. 1E and F).

3. Discussion

Type B aortic dissection does not remain an uncommon condition, treated by a conservative approach in the absence of complications. In complicated cases untreated or delayed treatment beyond the duration of visceral ischaemia tolerance results in death. The main goal is to resolve ischaemia as soon as possible.

The optimal management of patients with complicated type B acute dissections is still controversial. Traditional treatment has been surgery with either replacement of the dissected proximal thoracic descending aorta or fenestration. Both approaches have been associated with considerable morbidity and mortality (range between 15% and 30% under emergency conditions).^{3,4}

During the last decade, endovascular techniques have revolutionized the management of descending thoracic aortic disease, with the benefit of exclusion of the pathologically altered aorta without direct surgical exposure. In type B acute dissection, endovascular repair can effectively seal the proximal tear with thrombosis of the false lumen in up to 90–98% of the cases.⁵ Stent graft therapy could also result in less aneurysm development in the long term.⁶

Several Meta-analysis and clinical trials have examined the efficacy and safety of different treatment options for complicated type B aortic dissections and have shown a favourable outcome after endovascular therapy.¹

Also, recent data of register “International Registry of Acute Aortic Dissection” have favoured the endovascular option in patients with indication for surgery.⁷

Another advantage of endovascular treatment appears to be the extremely low incidence of medullary ischaemic complications despite the long length of coverage, sometimes over the entire descending thoracic aorta.⁸

In the case of our patient, Endovascular treatment decision was based on the existence of a threatening complication (ischaemia of left lower limb) and the ineligibility of the patient to conventional open surgery due to severe preoperative comorbidities and poor physiological condition.

Stent grafts have the disadvantage of requiring relatively stiff and large introducer systems. Retrograde aortic dissection involving the ascending aorta and perforations has been

reported, which were most likely related to the fragile texture of the sub-/acutely dissected aorta.⁹

In our case, no complication has been observed in per or postoperative course and complete thrombosis of the false lumen at the thoracic level was obtained with salvage of the left lower limb. The 12 months CT angiography revealed stable and open aortic stent graft with an almost closed false lumen.

4. Conclusion

Endovascular repair of the thoracic aorta has become an alternative therapeutic approach to surgery for complicated type B aortic dissections. Short and midterm results are persuasive, and the indications for endovascular repair are expected to expand in the future; however, the long-term effectiveness needs to be further evaluated.

Conflict of interest

None.

References

1. Tsai TT, Trimarchi S, Nienaber CA. Acute aortic dissection: perspectives from the International Registry of Acute Aortic Dissection. *Eur J Vasc Endovasc Surg* 2009;**37**(2):149–59.
2. White RA, Miller DC, Criado FJ, Dake MD, Diethrich EB, Greenberg RK, et al. Report on the results of thoracic endovascular aortic repair for acute, complicated, type B aortic dissection at 30 days and 1 year from a multidisciplinary subcommittee of the Society for Vascular Surgery Outcomes Committee. *J Vasc Surg* 2011;**53**(4):1082–90.
3. Umana JP, Miller DC, Mitchell RS. What is the best treatment for patients with acute type B aortic dissections medical, surgical, or endovascular stent-grafting? *Ann Thorac Surg* 2002;**74**:1840–3.
4. Bozinovski J, Coselli JS. Outcomes and survival in surgical treatment of descending thoracic aorta with acute dissection. *Ann Thorac Surg* 2008;**85**:965–70.
5. Schoder M, Czerny M, Cejna M, Rand T, Stadler A, Sodeck GH, et al. Endovascular Repair of acute type B aortic dissection: long-term follow-up of true and false lumen diameter changes. *Ann Thorac Surg* 2007;**83**:1059–66.
6. Akutsu K, Nejima J, Kiuchi K, Sasaki K, Ochi M, Tanaka K, et al. Effects of the patent false lumen on the long-term outcome of type B acute aortic dissection. *Eur J Cardiothorac Surg* 2004;**26**:359–66.
7. Svensson LG, Kouchoukos NT, Miller DC, et al. Expert consensus document on the treatment of descending thoracic aortic disease using endovascular stent-grafts. *Ann Thorac Surg* 2008;**8**:S1–S41.
8. Flechera E, Cluzelb P, Bonnet N, Auberta S, Gauberta A, Paviea A, et al. Endovascular treatment of descending aortic dissection (type B): short- and medium-term results. *Arch Cardiovasc Dis* 2008;**101**:94–9.
9. Massmann A, Kunihara T, Fries P, Schneider G, Buecker A, Schafers H. Uncovered stent implantation in complicated acute aortic dissection type B. *J Thorac Cardiovasc Surg* 2014;**148**(6):3003–11.